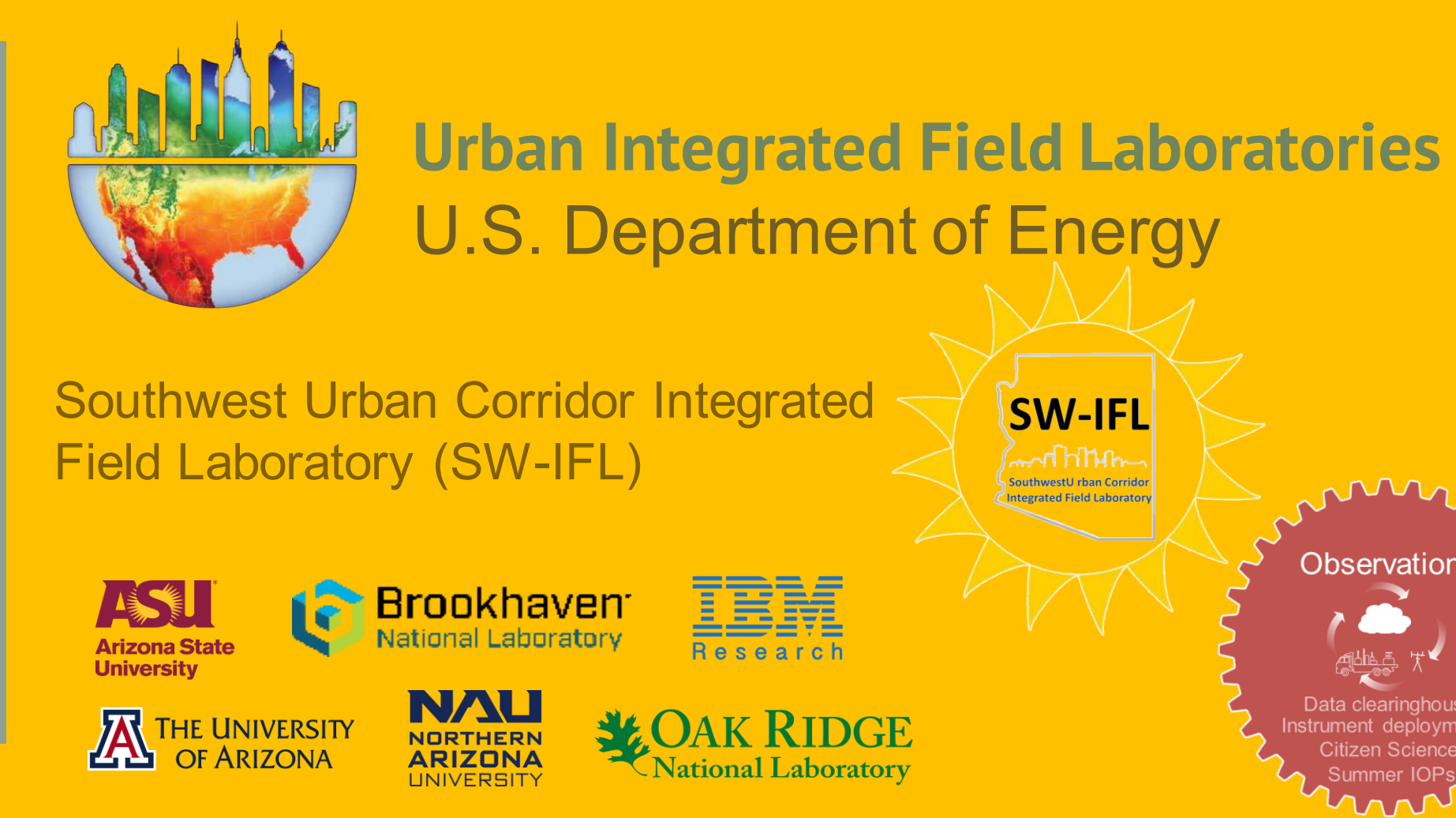


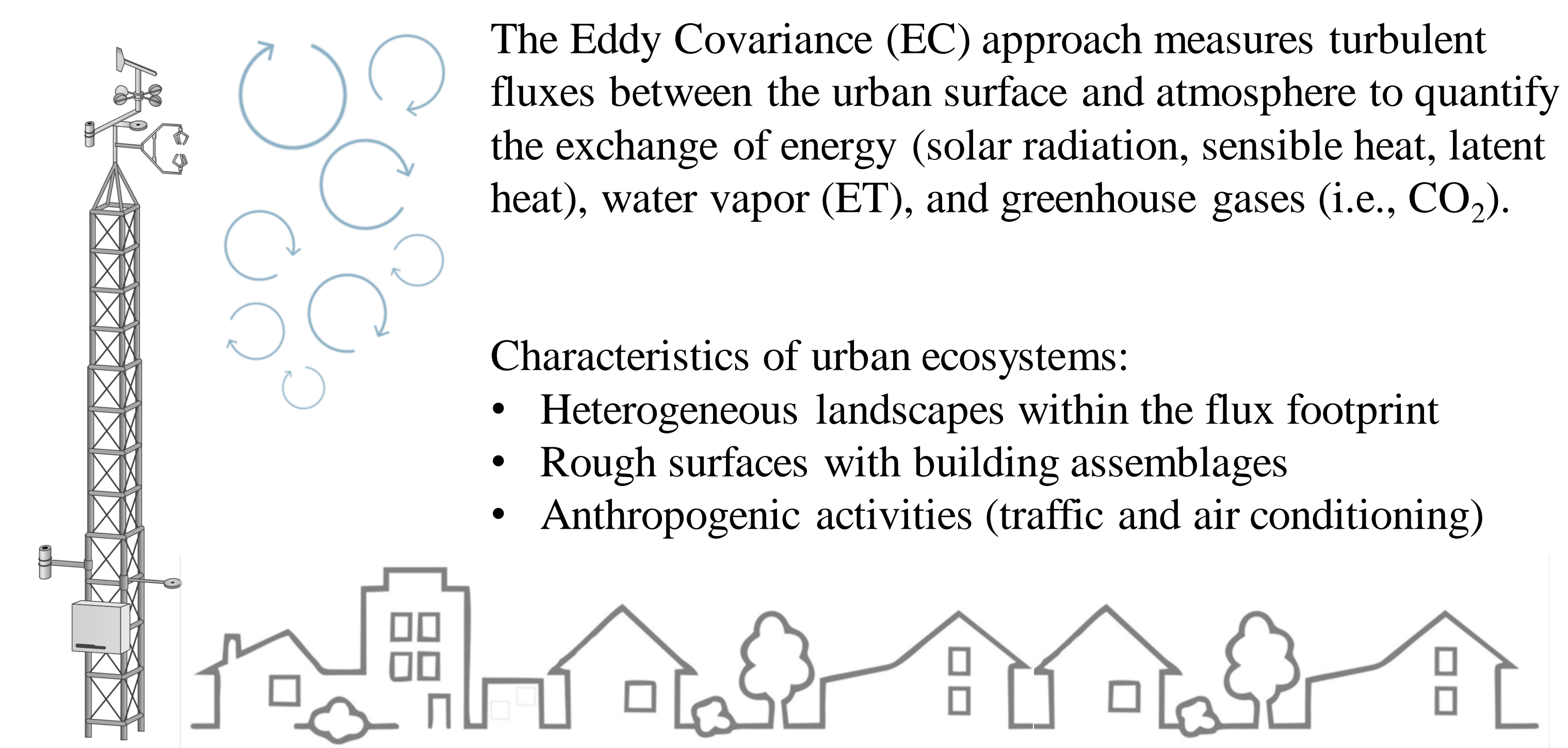
# Examining long-term dynamics and budgets of CO<sub>2</sub> flux in a suburban community in Phoenix, Arizona



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## Urban Eddy Covariance



## The Maryvale Site and Data Availability

We utilized the data from 2012 to 2021 to analyze the long-term variability of the water, energy, and CO<sub>2</sub> fluxes from intra-seasonal to interannual time scales, and the impacts of heat waves and droughts on CO<sub>2</sub> emissions in this urban environment.

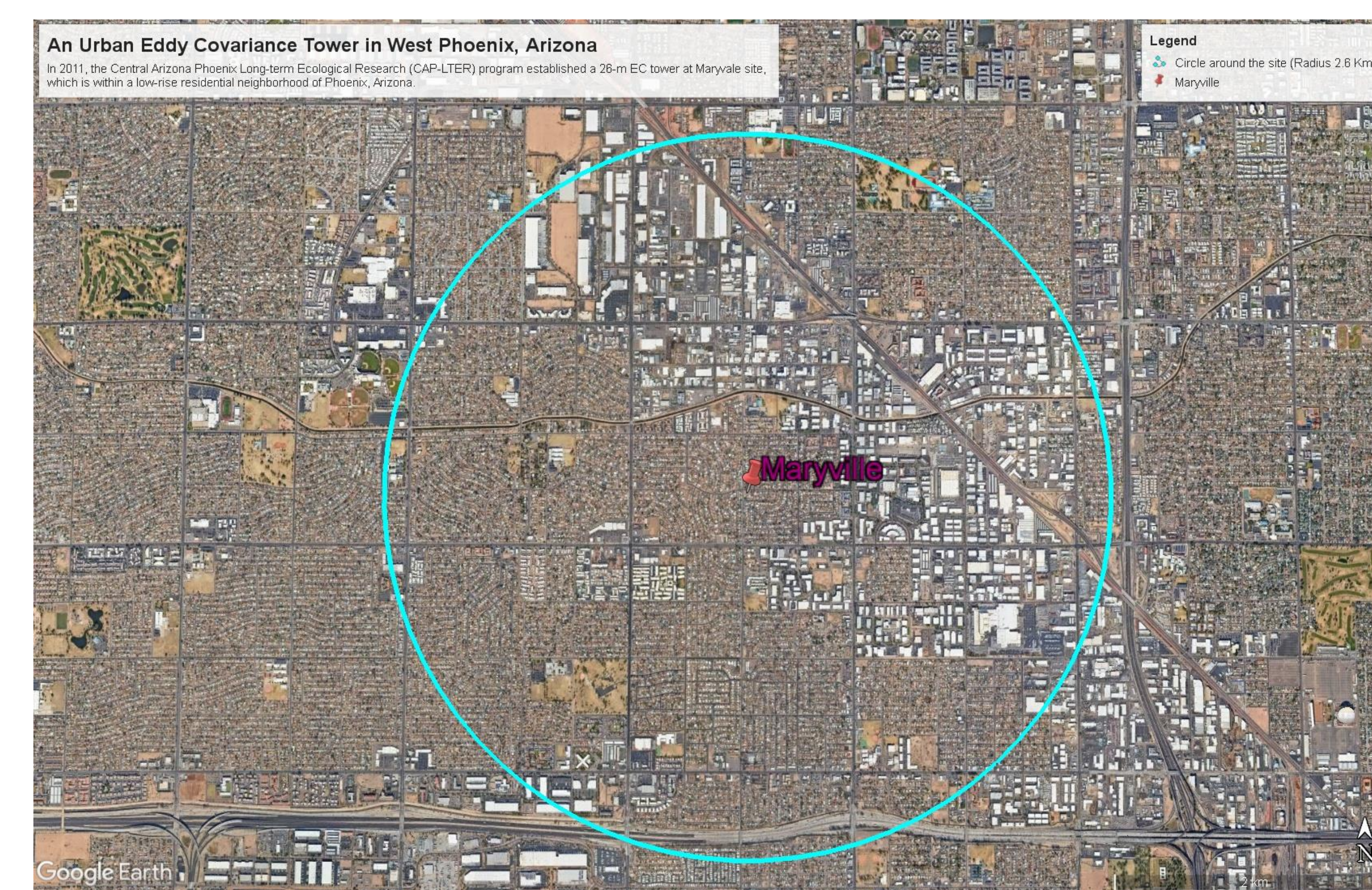


Figure 1. The location of the Maryville site and its surrounding landscape

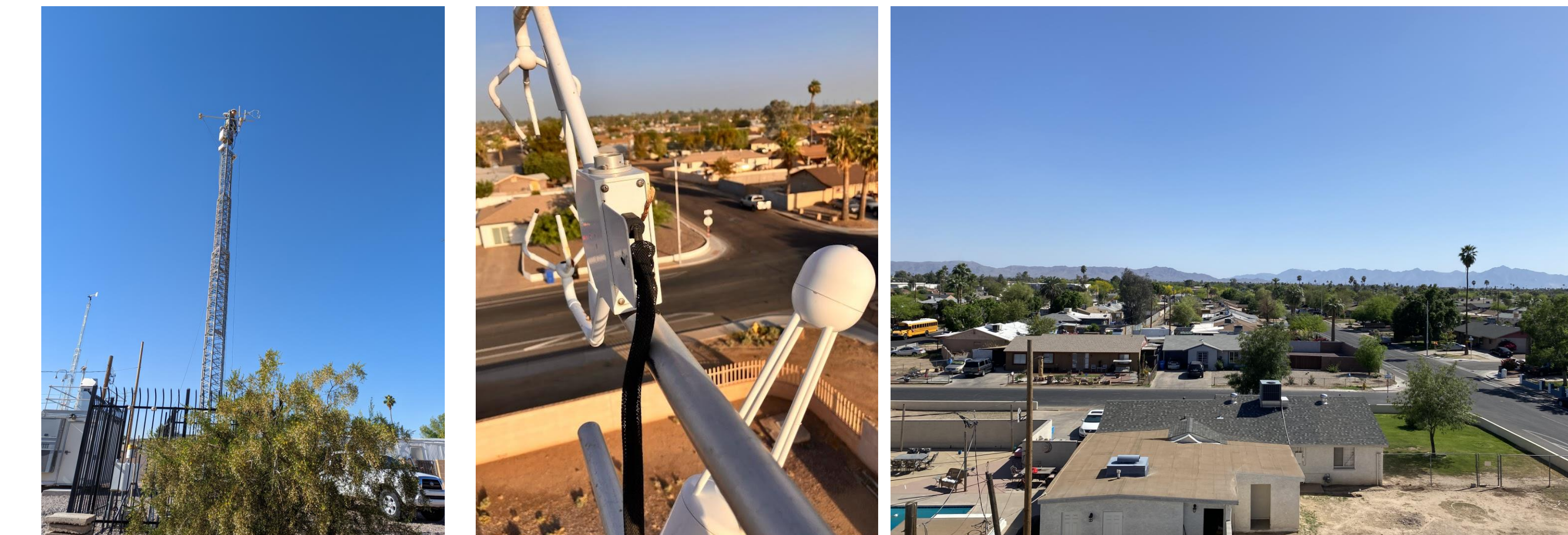
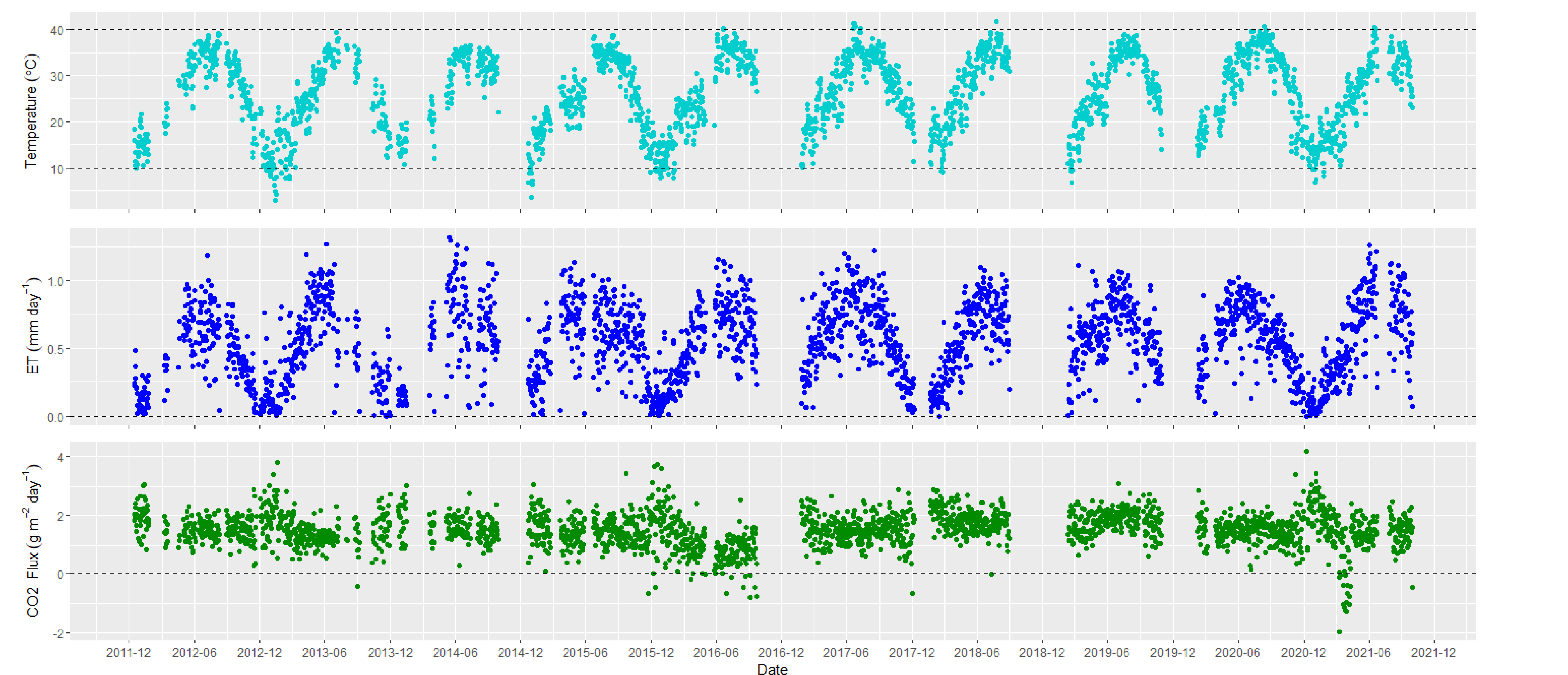


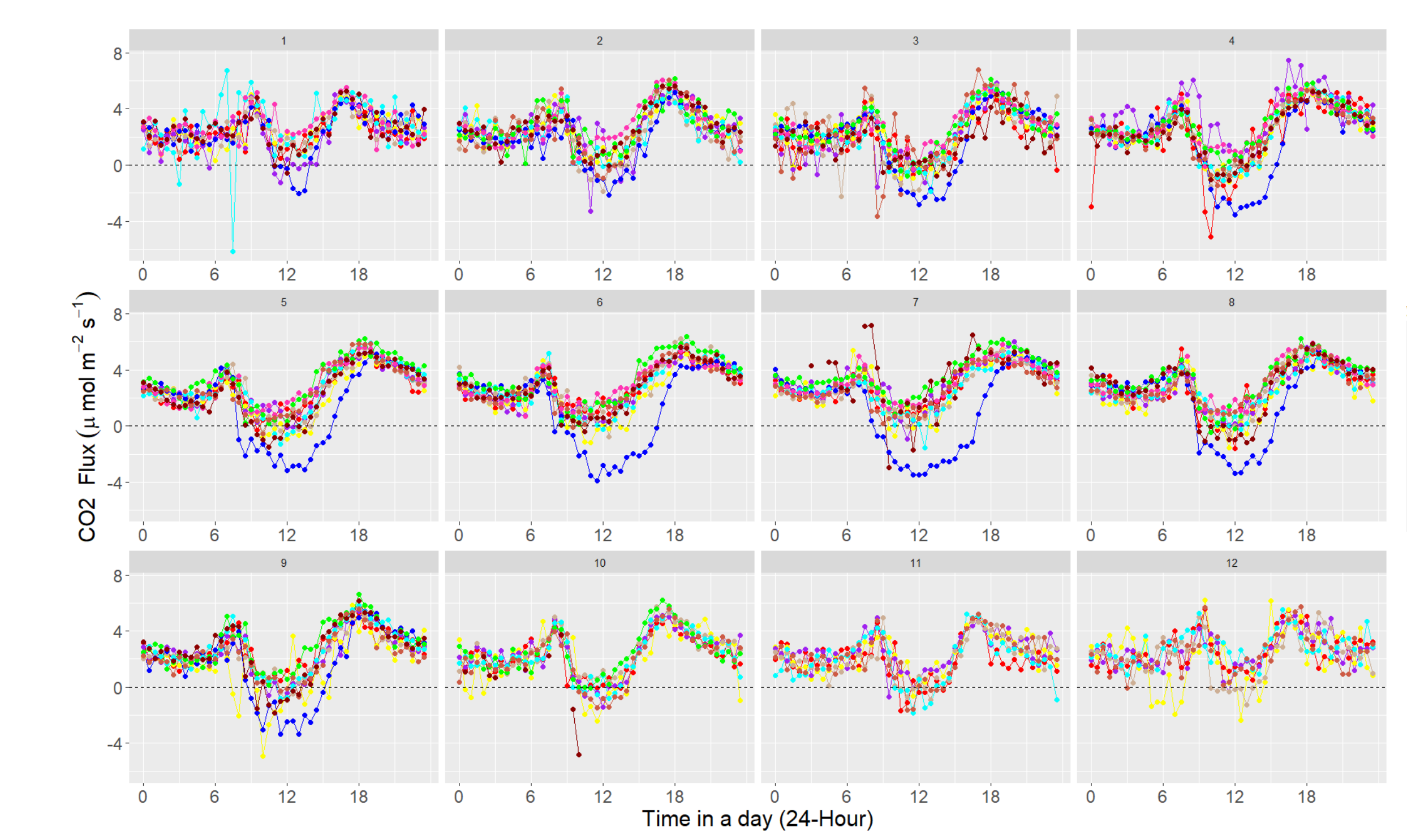
Figure 2. The field setup and the low-rise residential neighborhood

## Historical CO<sub>2</sub> flux Dynamics in Maryvale Site

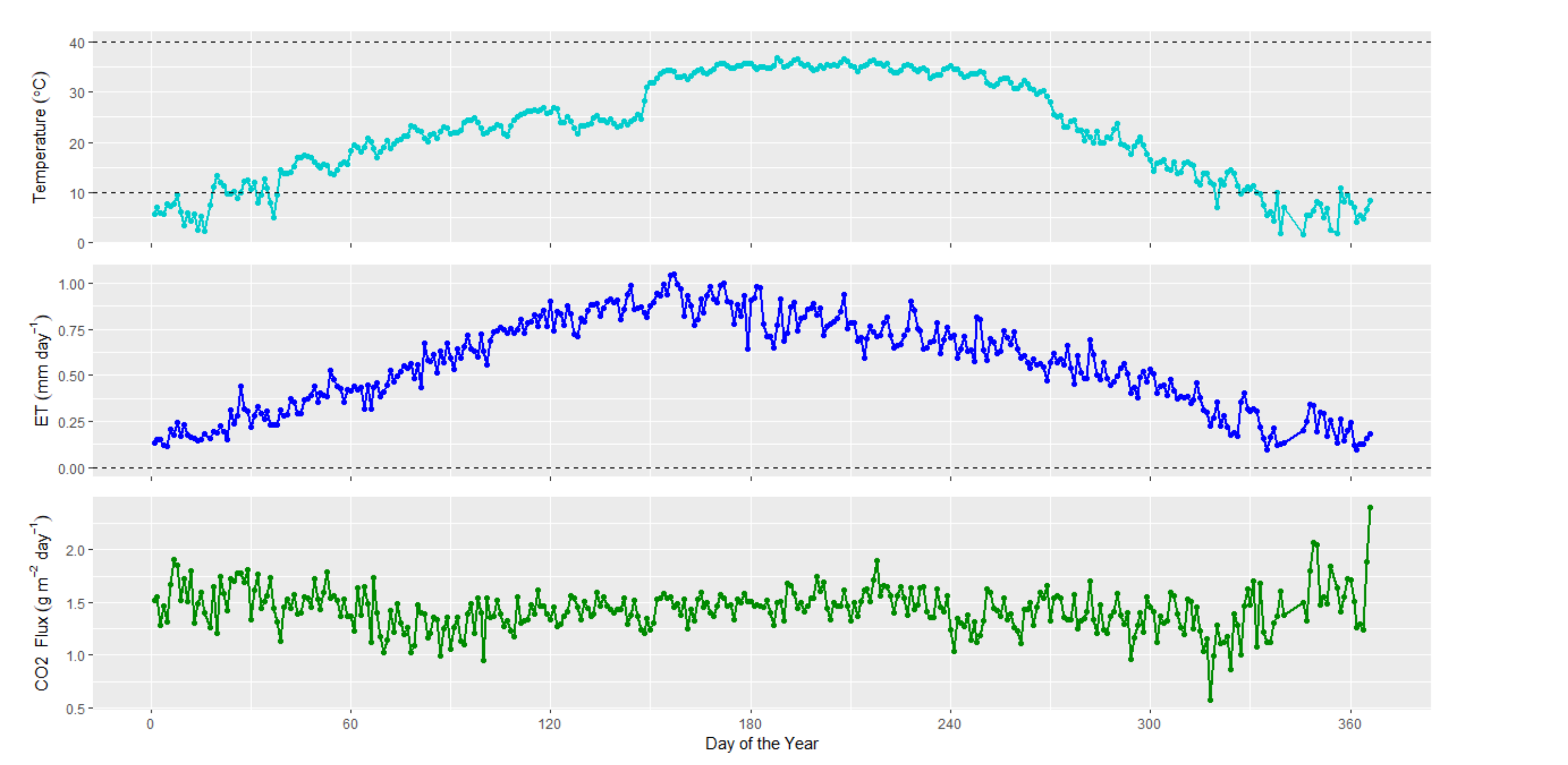
Daily Series of Air Temperature, Evapotranspiration (ET), and CO<sub>2</sub> flux observed at Maryvale Site from 2011 to 2021.



### Diurnal pattern of CO<sub>2</sub> flux (monthly ensemble)



### Seasonal pattern of ET and CO<sub>2</sub> flux (annually ensemble)



## Results and Summary

- The Maryvale EC site witnessed strong seasonality for ET flux, which was in synchronous with the air temperature dynamics.
- The site is consistently a carbon source with negligible seasonality of CO<sub>2</sub> flux at annual and interannual scales. However, diurnal variations in CO<sub>2</sub> flux exhibited a solid correspondence to rush hour timing (early morning and later afternoon).
- Long-term EC observation and flux results are critical for quantifying the temporal and spatial variability of water, energy, and CO<sub>2</sub> fluxes, particularly during periods of extreme heat waves and/or intensive drought stresses.

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